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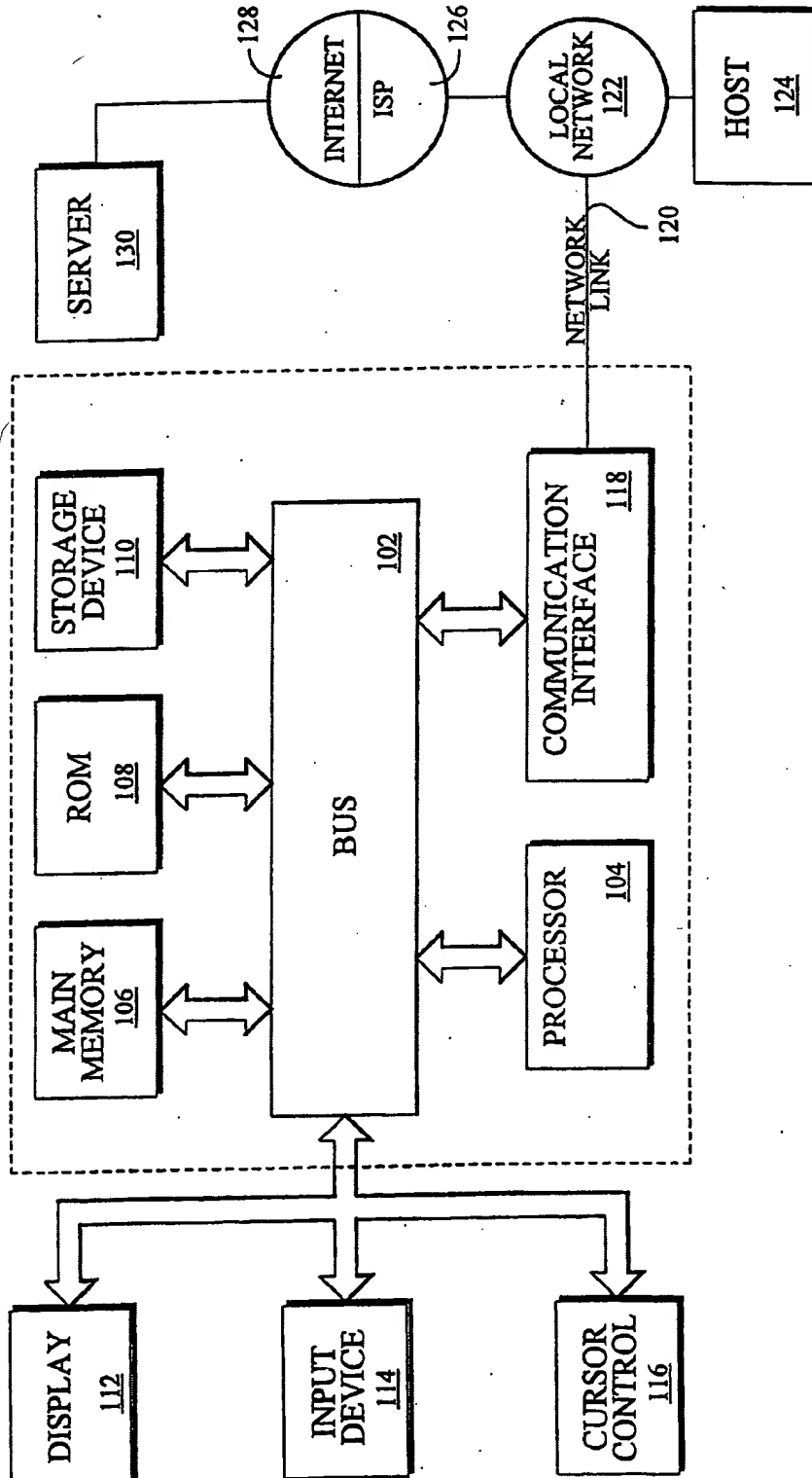


Fig. 1

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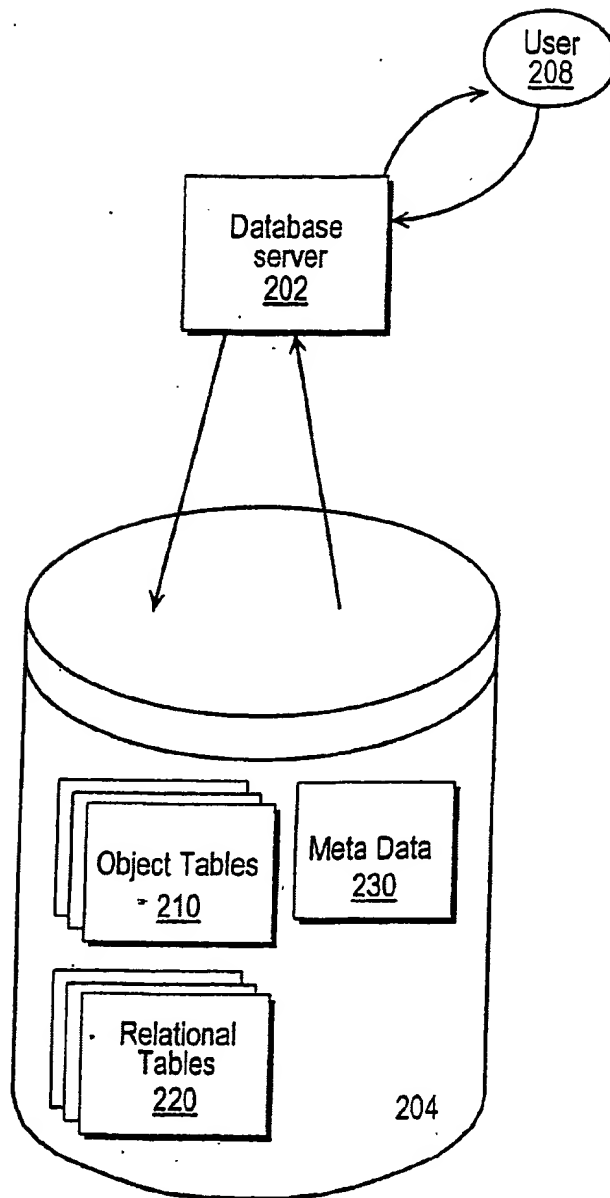


Fig. 2

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FORMER- EMPLOYEE Table Definition

Create Table FORMER EMPLOYEE (

NAME VARCHAR (30),
SSN VARCHAR (11),
STATE VARCHAR (2));

Fig. 3A

Table FORMER_EMPLOYEE

Name	SSN	State
Frank Doe	999-99-997	CA
Jane Doe	999-99-998	CA

Fig. 3B



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OT_EMPLOYEE
Create Type OT_EMPLOYEE As Object (

NAME VARCHAR2 (20),
SSN VARCHAR2 (11),
STATE REF STATE));

Fig. 3C

Table CURRENT_EMPLOYEES

308	OID	Name	SSN	State
	000000	John Doe	999-99-9999	CA
	000001	Jane Doe	999-99-9998	AL

Fig. 3D



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Create View OV_FEMPLOYEE of OT_EMPLOYEE
With Object OID (SSN)
As Select NAME, SSN, STATE
From FORMER_EMPLOYEES

Fig. 3E

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OID	NAME	STATE
999-99-9999	Frank Doe	CA
999-99-9998	Jane Doe	CA

Fig. 3F

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Create View OV_STATE_FEMPLOYEE of OT_SEMPLOYEE

AS Select FORMER_EMPLOYEE. NAME,
FORMER_EMPLOYEE. SSN,
STATE. NAME

From FORMER_EMPLOYEE,
STATE

Where FORMER_EMPLOYEE. STATE=STATE. ABBR;

Fig. 3G

TABLE STATE

NAME	ABBR
California	CA
Alabama	AL

Fig. 3H

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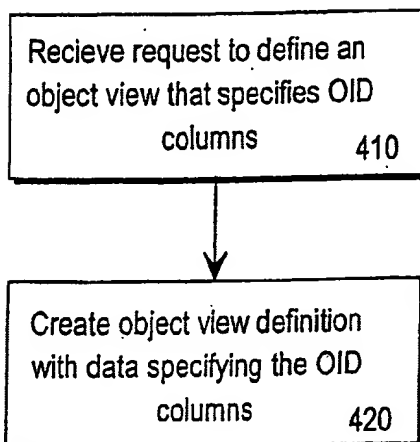
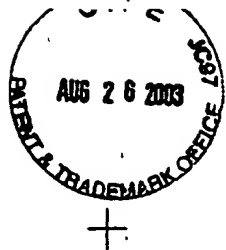


Fig. 4A



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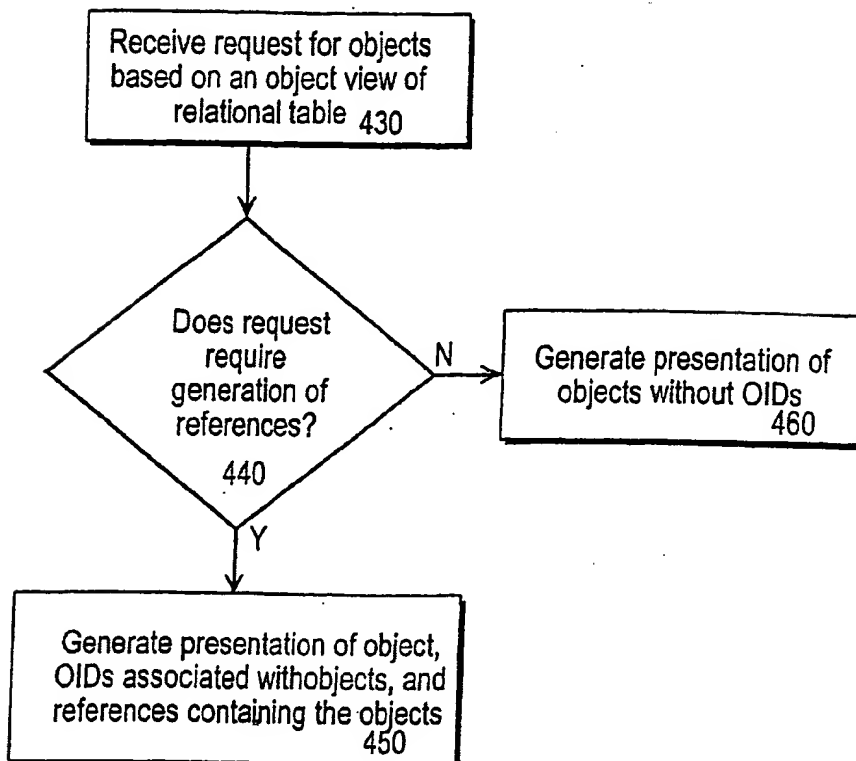


Fig. 4B



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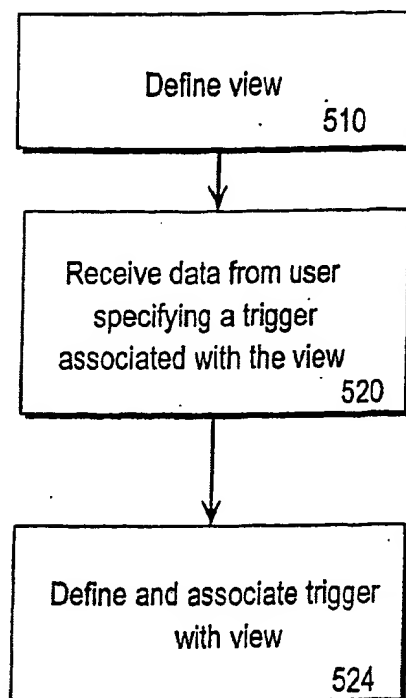


Fig. 5A

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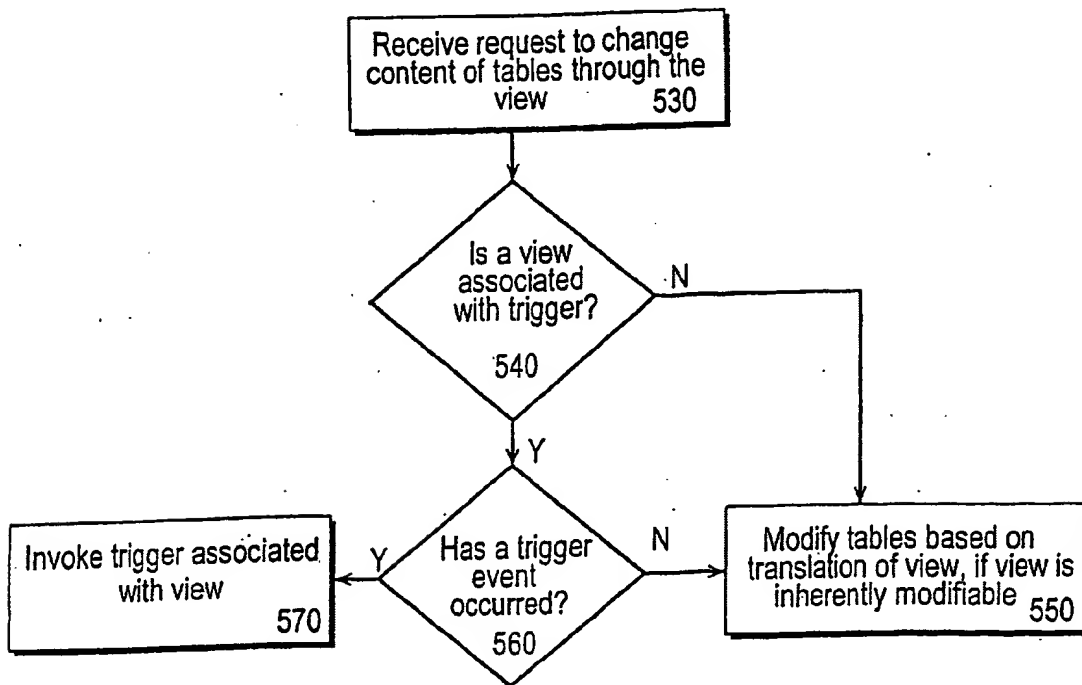


Fig. 5B



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Create OV_PERSON of OT_FAMILY As

Select

OT_PERSON_ID(p.NAME, p.SSN),

CAST (Multiset (Select * From PERSON p1 Where
p.FATHER_SSN = p1.SSN Or
p.MOTHER_SSN = p1.SSN)
As PARENTS),

CAST (Multiset(Select * From PERSON p2 Where
p.SSN = p2.FATHER_SSN Or
p.SSN = p2.MOTHER_SSN)
AS CHILDREN)

From PERSON p;

Fig. 6A

Create Type OT_FAMILY as Object (
PERSON_ID OT_PERSON_ID,
PARENTS LIST_OF_PARENTS,
CHILDREN LIST_OF_CHILDREN,
);

Fig. 6B



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```
Create Table PERSON (  
    NAME VARCHAR(30),  
    SSN VARCHAR(9),  
    FATHER_SNN VARCHAR(9),  
    MOTHER_SNN VARCHAR(9),  
);
```

Fig. 6C

```
Create Type OT_PERSON_ID as Object (  
    NAME VARCHAR(30),  
    SSN VARCHAR(11)  
);
```

Fig. 6D

Create LIST_OF_CHILDREN as Table of OT_PERSON_ID;

Fig. 6E

Create LIST_OF_PARENTS as VARRAY(2) of OT_PERSON_ID;

Fig. 6F

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